Measure Information Template (JH-13)

Category: Residential – additions and alterations.

Description: Require most additions to comply with the Energy Efficiency Requirements for new construction on a stand-alone basis, and require altered components of existing buildings to comply with the Energy Efficiency Requirements for new construction subject to certain exceptions.
(1) Title 24, Part 6, Section 152. Energy Efficiency Standards for Additions and Alterations to Existing Buildings that will be Low-Rise Residential Occupancies:

For additions, revise Exception 2 to 152 (a) to require that greenhouse windows and skylights have a low-emissivity coating in order to be exempted from the U-factor requirements. *These products should have a low-e coating to compensate for their high U-factor.*

For additions, revise 152 (a) 1 to require that fenestration comply with the U-factor requirements. *New components should comply with the new construction requirements.*.

For the alterations prescriptive option, revise Section (b) 1A so that the altered component complies with the prescriptive building envelope requirements and the alteration does not increase the heat loss or heat gain. *The Energy Efficiency Standards should have a goal of eventually bringing all existing buildings up to code over time. To achieve this, each time that a portion of the building envelope is altered, that portion should be brought into compliance with the new construction requirements. If the fenestration area is increased, improvements should be made in other portions of the existing building to compensate for the increased heat loss and heat gain.*

For the alterations performance option, revise Section (b) 2 so that it is based on the prescriptive building envelope requirements. *The Energy Efficiency Standards should have a goal of eventually bringing all existing buildings up to code over time. To achieve this, each time that a portion of the building envelope is altered, that portion should be brought into compliance with the new construction requirements.*

For the alterations section, revise note at the end of Section (b) to allow replacement of glass alone in-kind (such as a broken pane), but to require that replacement fenestration comply with the new construction requirements. *The Energy Efficiency Standards should have a goal of eventually bringing all existing buildings up to code over time. To achieve this, each time that a portion of the building envelope is altered, that portion should be brought into compliance with the new construction requirements. An opening for a replacement window in an existing wall is similar to an opening for a new window in a new wall. Consequently, the requirements should not be different.*

Code Language Proposal:

- Title 24, Part 6, Section 152. Energy Efficiency Standards for Additions and Alterations to Existing Buildings that will be Low-Rise Residential Occupancies (pages 155-158).

Title 24, Part 6, SECTION 152

– ENERGY EFFICIENCY STANDARDS FOR ADDITIONS AND ALTERATIONS TO EXISTING BUILDINGS THAT WILL BE LOW-RISE RESIDENTIAL OCCUPANCIES

(a) **Additions.** Additions to existing residential buildings shall meet the requirements of Sections 111 through 118, Section 150, and either Section 152 (a) 1 or 2.

EXCEPTION 1 to Section 152 (a): Existing structures with R-11 framed walls showing compliance with Section 152 (a) 2 (Performance Approach) are exempt from Section 150 (c).

EXCEPTION 2 to Section 152 (a): Any dual-glazed greenhouse window having a low-emissivity coating and dual-glazed skylight having a low-emissivity coating installed in an addition complies with Section 151 (f) 3 A.

EXCEPTION 3 to Section 152 (a): If the addition will increase the total number of water heaters in the building, one of the following types of water heaters may be installed to comply with Section 152 (a) 1 or Section 152 (a) 2 A, and Section 152 (c):

1. A gas storage nonrecirculating water-heating system that does not exceed 50 gallons capacity; or
2. If no natural gas is connected to the building, an electric storage water heater that does not exceed 50 gallons capacity, has an energy factor not less than 0.90; or
3. A water-heating system determined by the executive director to use no more energy than the one specified in Item 1 above; or if no natural gas is connected to the building, a water-heating system determined by the executive director to use no more energy than the one specified in Item 2 above.

For prescriptive compliance with Section 152 (a) 1, the water-heating systems requirement in Section 151 (f) 8 shall not apply. For performance compliance for the addition alone, only the space-conditioning budgets of Section 151 (b) 2 shall be used; the water-heating budgets of Section 151 (b) 1 shall not apply.

The performance approach for the existing building and the addition in Section 152 (a) 2 B may be used to show compliance, regardless of the type of water heater installed.

EXCEPTION 4 to Section 152 (a): When heating and/or cooling will be extended to an addition from the existing system(s), the existing equipment need not comply with Title 24, Part 6. The heating system capacity must be adequate to meet the minimum requirements of UBC Section 310.11.

1. **Prescriptive approach.** Additions to existing buildings shall meet the following additional requirements:

   A. Additions up to 100 square feet shall not exceed 50 square feet of glazing, the glazing U-factor and the glazing Solar Heat Gain Coefficient shall not exceed the value specified in Alternative Component Package D (Tables 1-Z1 through 1-Z16); or

   B. Additions less than 1000 square feet shall meet all the requirements of Package D (Section 151 (f) and Tables 1-Z1 through 1-Z16), except that the addition's total glazing area limit is the maximum allowed in Package D plus the glazing area that was removed by the addition, and the wall insulation value need not exceed R-13.

   C. Additions of 1000 square feet or greater shall meet all the requirements of Package D (Section 151 (f) and Tables 1-Z1 through 1-Z16).

2. **Performance approach.** Performance calculations shall meet the requirements of Section 151 (a) through (e), pursuant to either Item A or B, below.

   A. The addition complies if the addition alone meets the combined water-heating and space-conditioning energy budgets.

   B. Provided that the addition has a floor area which is less than 750 ft^2, the addition complies if the energy efficiency of the existing building is improved such that the source energy consumption of the improved existing building and the addition is equal to or less than that of the unimproved existing building plus an addition that complies with the applicable energy budget.

(b) **Alterations.** Alterations to existing residential buildings or alterations in conjunction with a change in building occupancy to a low-rise residential occupancy shall meet either Item 1 or 2 below.

1. **Prescriptive approach.** The altered component and any newly installed equipment serving the alteration shall meet the applicable requirements of Sections 110 through 118 and 150; and

A. Alterations that add fenestration area to a building shall be limited to a maximum U-factor and the Solar Heat Gain Coefficient for new fenestration products as specified in Alternative Component Package D (Tables 1-Z1 through 1-Z16), and the alterations shall neither increase the overall heat gain nor increase the overall heat loss of the building envelope.

B. New space-conditioning systems or components shall:

i. Meet the requirements of Section 150 (h) and (i) and Section 151(f)7; and

ii. Be limited to natural gas, liquefied petroleum gas, or the existing fuel type unless it can be demonstrated that the source energy use of the new system is more efficient than the existing system.

C. New service water-heating systems or components shall:

i. Meet the requirements of Section 150; and

ii. Be limited to natural gas, liquefied petroleum gas, or the existing fuel type unless it can be demonstrated that the source energy use of the new system is more efficient than the existing system.

2. **Performance approach.**

A. The altered components shall meet the applicable requirements of Sections 110 through 118 and 150; and

B. the permitted space alone, which shall be a minimum of the square footage of the room in which the alteration is made, shall comply with Section 151
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EXCEPTION to Section 152 (b) 1 A: Any dual-glazed greenhouse window having a low-emissivity coating and dual-glazed skylight having a low-emissivity coating installed as part of an alteration complies with the U-factor requirements applicable to prescriptive alterations.

NOTE: Glass replaced in existing sash and frame need not comply with the U-factor and Solar Heat Gain Coefficient requirements applicable to alterations provided that glazing is of equal or lower U-factor and Solar Heat Gain Coefficient. However, replacement of glass and sash, or glass, sash and frame shall comply with the U-factor and Solar Heat Gain Coefficient requirements.

EXCEPTION to 152 (b) 2 B: When the existing fuel type is electric, the existing or replacement equipment for heating, cooling and/or domestic water heating of the proposed building shall be assumed to be the same fuel type as the standard building.

(c) Electric-resistance water-heating or space-conditioning systems may be installed in or in conjunction with an addition only if the electric-resistance system meets the applicable energy budget(s) from Section 151 (b) pursuant to Section 152 (a) 2.

(d) Any addition or alteration may comply with the requirements of Title 24, Part 6 by meeting the requirements for new buildings for the building as a whole.

NOTE: Authority cited: Public Resources Code, Sections 25218(e), 25402, and 25402.1 Reference: Public Resources Code, Section 25402.

Benefits: Achieves energy savings through improvements in existing buildings.

Environmental Impact: Energy savings.

Type of Change: Prescriptive.

Measure Availability and Cost: Complying fenestration products and insulation are widely available. Building envelope efficiency improvements are required for additions and alterations in the Washington State/Seattle Energy Codes, Section 101.3.2.

Useful Life, Persistance and Maintenance: Comparable to new construction.

Performance Verification: Comparable to new construction.

Cost Effectiveness: Complying fenestration products and insulation are widely available. An opening for a replacement window in an existing wall is similar to an opening for a new window in a new wall. Consequently, the requirements should not be different. Building envelope efficiency improvements are required for additions and alterations in the Washington State/Seattle Energy Codes, Section 101.3.2.

Analysis Tools: NA.

Relationship to Other Measures: NA.

Bibliography and Other Research: Washington State/Seattle Energy Codes, Section 101.3.2.